

-100mA / -50V Digital transistors (with built-in resistors)

DTA115EM / DTA115EE / DTA115EUA / DTA115EKA / DTA115ESA

●Applications

Inverter, Interface, Driver

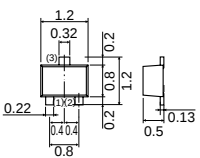
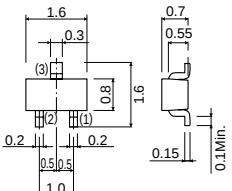
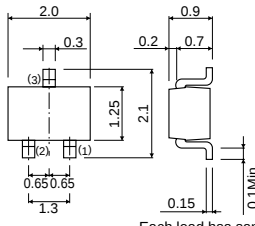
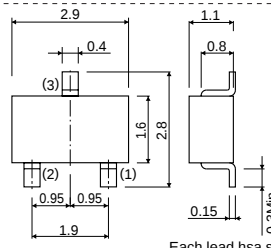
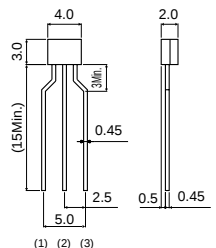
●Features

- 1) Built-in bias resistors enable the configuration of an inverter circuit without connecting external input resistors (see equivalent circuit).
- 2) The bias resistors consist of thin-film resistors with complete isolation to allow positive biasing of the input, and parasitic effects are almost completely eliminated.
- 3) Only the on/off conditions need to be set for operation, making the device design easy.
- 4) Higher mounting densities can be achieved.

●Structure

PNP epitaxial planar silicon transistor (Resistor built-in type)

●External dimensions (Unit : mm)

DTA115EM  ROHM : VMT3 Abbreviated symbol : 19 (1) IN (2) GND (3) OUT	DTA115EE  ROHM : EMT3 Abbreviated symbol : 19 (1) GND (2) IN (3) OUT
DTA115EUA  ROHM : UMT3 EIAJ : SC-70 Abbreviated symbol : 19 Each lead has same dimensions (1) GND (2) IN (3) OUT	DTA115EKA  ROHM : SMT3 EIAJ : SC-59 Abbreviated symbol : 19 Each lead has same dimensions (1) GND (2) IN (3) OUT
DTA115ESA  ROHM : SPT EIAJ : SC-72 Abbreviated symbol : A115ES (1) GND (2) OUT (3) IN	

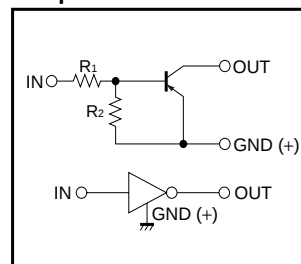
DTA115EM / DTA115EE / DTA115EUA DTA115EKA / DTA115ESA

Transistors

●Packaging specifications

	Package	VMT3	EMT3	UMT3	SMT3	SPT
	Packging type	Taping	Taping	Taping	Taping	Taping
	Code	T2L	TL	T106	T146	TP
Part No.	Basic ordering unit (pieces)	8000	3000	3000	3000	5000
DTA115EM		○	—	—	—	—
DTA115EE		—	○	—	—	—
DTA115EUA		—	—	○	—	—
DTA115EKA		—	—	—	○	—
DTA115ESA		—	—	—	—	○

●Equivalent circuit



$R_1=R_2=100\text{k}\Omega$

●Absolute maximum ratings (Ta=25°C)

Parameter	Symbol	Limits	Unit
Supply voltage	V_{CC}	-50	V
Input voltage	V_i	-40 to +10	V
Output current	I_o	-20	mA
	$I_{C(\text{Max.})}$	-100	
Power dissipation	DTA115EM / DTA115EE	150	mW
	DTA115EUA / DTA115EKA	200	
	DTA115ESA	300	
Junction temperature	T_j	150	°C
Storage temperature	T_{stg}	-55 to +150	°C

●Electrical characteristics (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Input voltage	$V_{i(\text{off})}$	—	—	-0.5	V	$V_{CC} = -5\text{V}$, $I_o = -100\mu\text{A}$
	$V_{i(\text{on})}$	-3	—	—		$V_o = -0.3\text{V}$, $I_o = -1\text{mA}$
Output voltage	$V_{o(\text{on})}$	—	-0.1	-0.3	V	$I_o = -5\text{mA}$, $I_i = -0.25\text{mA}$
Input current	I_i	—	—	-0.15	mA	$V_i = -5\text{V}$
Output current	$I_{o(\text{off})}$	—	—	-0.5	μA	$V_{CC} = -50\text{V}$, $V_i = 0\text{V}$
DC current gain	G_i	82	—	—	—	$I_o = -5\text{mA}$, $V_o = -5\text{V}$
Input resistance	R_i	70	100	130	$\text{k}\Omega$	—
Resistance ratio	R_z/R_i	0.8	1	1.2	—	—
Transition frequency	f_T *	—	250	—	MHz	$V_{CE} = -10\text{V}$, $I_E = 5\text{mA}$, $f = 100\text{MHz}$

* Characteristics of built-in transistor

Transistors

●Electrical characteristics curves

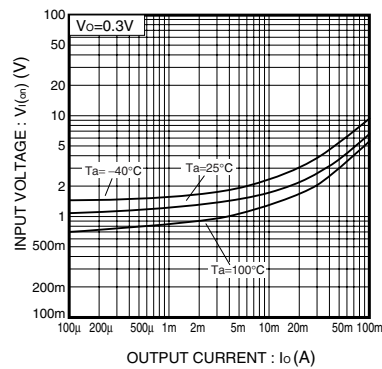


Fig.1 Input voltage vs. Output current (ON characteristics)

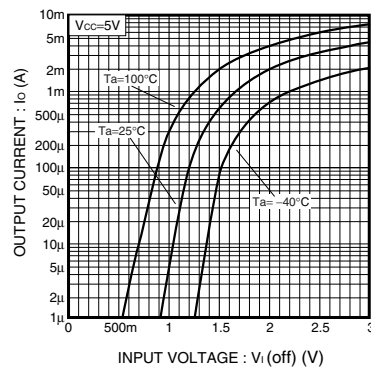


Fig.2 Output current vs. Input voltage (OFF characteristics)

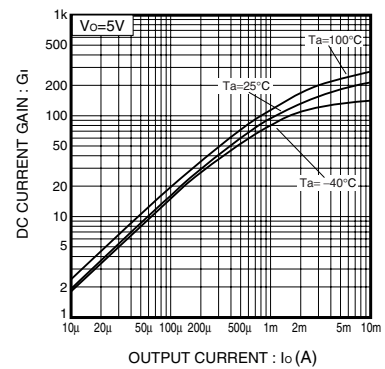


Fig.3 DC current gain vs. Output current

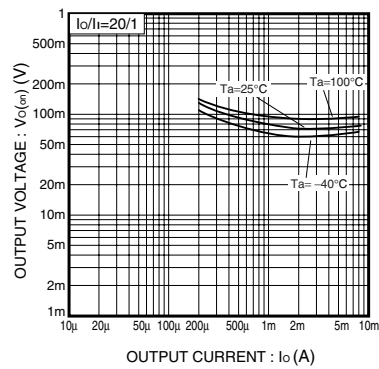


Fig.4 Output voltage vs. Output current

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